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India-Korea CEPA: An Assessment*

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The present study investigates the potential economic impacts of India-Korea CEPA using partial and general equilibrium analysis. This study more specifically looked at consumer surplus, trade creation and diversion results as well as the impact on tariff revenues. The study indicates positive effect of CEPA on consumer surplus, trade and investment flows, and negative effect on tariff revenues. The study recommends diversifying the tax base and developing alternative less distortionary revenue generating strategy to compensate the tariff revenue loss. The study further suggests strengthening the national capacity to limit rent capturing capacity of importers and exporters so that the consumers can draw the benefits of CEPA. Overall CGE based assessment of FTA in goods is not encouraging for India as the welfare is expected to decline. Finally, unique selling point of this CEPA for India is the increased inflows of Korean FDI and hence lots of efforts are needed in this regard.

JEL Classification: C68, F12, F15, F17, F21

Keywords: CEPA, trade intensity index, CPE, CGE

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1. INTRODUCTION

Economic theory argues that the liberalization of trade promotes efficiency, scale economies, competition, factor productivity and trade flows, thereby, promoting economic growth (Barro and Sala-i-Martin, 1995; Wacziarg, 1997). Despite liberal trade reforms in many countries, researchers have identified variety of country-specific barriers, which impede the growth of world trade (Kalirajan, 1999). These constraints would create a “trade-gap” by reducing actual trade flows between countries from their potential levels (Kalirajan, 2007). It is in this context, besides multilateral efforts, regional and bilateral efforts facilitate countries to address some of these barriers.

Doha Round of WTO was conceptualized for removing the trade distortions in international trading regime for the development oriented trade integration of developing countries (Ahmed, 2008). Given the slow progress of Doha Round in the WTO, both developed and developing countries have moved towards regionalism or bilateralism to cater to their growth and developmental needs. As a result, the number of regional trading agreements (RTAs) has proliferated in alarming way. Up to February 2010, 462 RTAs have been notified to the GATT/WTO; 345 RTAs were notified under Article XXIV of the GATT 1947 or GATT 1994; 31 under the Enabling Clause; and 86 under Article V of the GATS. Of these RTAs, Free Trade Agreements (FTAs) and partial scope agreements account for 90%, while customs unions account for 10 % (WTO, 2010).

In recent times, India has also witnessed an increasing emphasis on India's economic partnership arrangements with various countries and regions. Some of which are in the immediate neighbourhood and some are in the inter-regional framework of economic cooperation. The interactions have ranged from bilateralism to sub-regionalism to regionalism. Some of the initiatives that are in the process of being studied, negotiated and implemented include India-Singapore Comprehensive Economic Cooperation Agreement (CECA), India-ASEAN FTA, India-Korea Comprehensive Economic Partnership Agreement (IKCEPA), India-Japan

Comprehensive Economic Partnership Agreement (IJEPA), India-China Economic Cooperation, India-GCC economic cooperation, India-Brazil-South Africa (IBSA) Initiative, India-Mauritius and India-Egypt Economic Partnership, India-EU Economic Cooperation, India-US FTA, India-Australia FTA, etc.

A major highlight of the recent attempts at economic cooperation initiatives is in terms of broadening of scope and emphasis ranging from trade to investment and services. India is now focusing on non-tariff barriers along with tariffs as well as on services along with goods. Investment cooperation has also emerged as an area of priority. In addition, intensive work is being done on issues like the rules of origin, mutual recognition agreements (MRAs), anti-dumping provisions, revenue compensation mechanism, safeguards like sensitive or negative lists, time schedule for tariff elimination/concession, dispute settlement modalities, etc. In short, in the present-day agreements, India has placed considerable emphasis on making them as comprehensive as possible.

India, the second largest in the world after China in terms of population, is one of the fastest growing markets in the world. Its economic growth averages around 8% and its gross domestic product amounts to \$3.3 trillion in terms of purchasing power, fourth in the world after the U.S., China and Japan. In the recent years, Indian economy has not only enhanced market access for Korean goods but has also provided investment opportunities for internationally competitive Korean companies. South Korea is classified as a high-income economy, Asia's fourth largest economy and having a very high HDI, measuring particularly high in the Education Index, where it is ranked first in Asia and seventh worldwide. South Korea is currently ranked as the most innovative country in the world among major economies in the Global Innovation Index. Despite immense potential to enhance economic cooperation between the two sides, the current size of trade and investment is very low compared to the size and structural complementarities of the two economies because of several tariff and non-tariff barriers in both economies. In this context, the signing of India-Korea CEPA has been welcomed and

rightly so, by both the business community and policy makers from both the countries. This agreement which has provisions for substantial reduction of both tariffs and non-tariff barriers in a phased manner is expected to take India-Korea relations to a higher level and enhance India's presence in East Asia.

Despite widely acclaimed significance of India-Korea trade and investment relations; there is a dearth of empirical research work on India-Korea economic relations in general. To the best of my knowledge, there is no empirical research work based on scientific methodologies on probable impacts of India-Korea CEPA. The present study has made an attempt to examine economic benefits that India and Korea can derive from the establishment of an FTA and to compare various hypothetical tariff liberalization scenarios on certain key variables, such as prices, welfare, employment, imports and exports using GTAP and SMART model. In addition, this paper has also made an attempt to identify untapped investment opportunities in various sectors in India. Thus, the present study will add to the existing literature on these issues.

In this context, the main objectives of this paper are (i) to simulate the gains and losses in terms of trade and investment due to recently signed India-Korea CEPA and (ii) to suggest policy conclusions that can be drawn as inputs into the policymaking process for furthering the mutual interest of both countries. The remainder paper is arranged as follows: section 2 provides the review of selected literature. Section 3 briefly discusses the India-Korea CEPA and its objectives. Section 4 reviews bilateral trade relations between India and South Korea. Section 5 discusses research methodology and data bases. Section 6 presents various simulation scenarios. Section 7 reports and discusses the GTAP and SMART results while section 8 provides concluding remarks.

2. REVIEW OF THE SELECTED LITERATURE

There have been intense theoretical expositions by trade theorists on the likely impact of regionalism and bilateralism on the international trade flows of commodities. The earliest work on the theory of regional integration was presented by Viner (1950) in his seminal work ‘The customs union issue’ where he used two concepts namely ‘trade creation’ and ‘trade diversion’ to explain the economic outcome of the regional integration and demonstrated that ‘trade diversion’ is harmful to world trade. Subsequently Meade (1955), Vanek (1965), Ohyama (1972) and Kemp and Wan (1976) made substantial improvements in the theory of regional integration. Economic theory suggests that the most desirable trading bloc is one that is the most trade-creating, and that bloc is global. Such a bloc comprises countries with the most diverse range of comparative advantage, which affords the greatest scope for trade creation and the least scope for trade diversion (Schott, 1991).

The case for a global trading bloc (i.e. global free trade) is a result of standard trade theory which may partly be materialized if free, transparent and non distorting trade flows of goods and services take place under WTO rule based regime. Due to slow movement in WTO rule based regime, the widespread of RTAs/FTAs has led to the debate whether they help or hinder the broader process of multilateral trade liberalization. Are they, in Bhagwati’s (1993) phrase, “building blocks” or “stumbling blocks” on the road to global free trade? Researchers like Oye (1992), Kahler (1995), Ethier (1998), Lazer (1999), Mansfield and Reinhardt (2003) and Sampson and Woolcock (2003) state that regionalism isn’t blocking multilateralism; instead it is assisting its development while Richardson (1994), Winters (1996), Levy (1997) and Krishna (1998) say that regionalism can hinder the move to multilateralism. It is still unresolved theoretically and empirically whether RTAs facilitates or hinders multilateralism in trade.

Another important dimension of RTAs is the flow of foreign direct investment (FDI) among RTAs/FTAs partners. Linkage between trade and FDI has now been established in theoretical as well as empirical literature.

Following Mundell (1957), it was long thought that FDI substitutes trade. The proposition was challenged by Agmon (1979), and subsequently a number of studies emphasised potential complementarities between FDI and trade. This literature has been reviewed by Ethier (1994, 1996, and 1998) and Markusen (1995 and 1998). Ethier (1998) has shown that membership in RTAs can provide small but crucial competitive advantages to countries that can help them attract large FDI inflows. Preferential treatment for RTA members can generate not only the well known 'trade creation' and 'trade diversion' effects, but also 'investment creation' and 'investment diversion' effects. The empirical literature corroborates the above arguments. Chakrabarti (2001) argues that after market size, openness to trade has been the most reliable indicator of the attractiveness of a location for FDI. Studies that examine the impact of openness to trade and regional agreements for trade on FDI inflows and find them to be important determinants are Gastanaga, Nugent and Pashmova (1998), Taylor (2000), Chakrabarti (2001) and Asiedu (2002).

Many empirical studies have tried to study the impact of FTAs on intra-regional and extra-regional FDI. Yeyati *et al.* (2003) find that regional integration on the whole contributes to attracting FDI. A study by Velde and Bezemer (2006) on the other hand, established that the impact on FDI would be different for different types of regions and the position of countries within a region would be pivotal for attracting FDI. UNCTAD (2006) shows that the EU has increased its share in global FDI inflows following the formation of the single market from nearly 30% in 1980s to about 50% in 1990s and has stayed there. Globerman and Shapiro (1999) find that Canada-US free trade agreement (CUFTA) and North American free trade agreement (NAFTA) increased both inward and outward FDI. In the context of Korea-US FTA, Kang and Park (2004) found that FTA increased FDI by 14-35% from member countries and by 28-35% from non-member countries. Baltagi *et al.* (2007) conducted a study on bilateral outward FDI stocks into Europe over 1989-2001 and found that an RTA increases FDI up to 78% among European countries.

3. CEPA AND ITS OBJECTIVE

Recognising their long-standing friendship, strong economic ties and close cultural links, the benefits of a CEPA between India and Korea were examined by Joint Study Group (JSG) in January 2005. The recommendations of JSG served as the framework for negotiations on the CEPA and its structure as an integrated package of agreements. The CEPA, which came into effect in 2010, has provisions for substantial cuts in both tariff and non-tariff barriers. These will be implemented in a phased manner. Tariffs would be reduced or eliminated on 93% of Korea's tariff lines and 85% of India's tariff lines. The details are provided in Appendix.

The CEPA would improve their attractiveness to capital and human resources, and create larger and new markets, to expand trade and investment not only between them but also in the region. The objectives of this Agreement, as elaborated more specifically through its principles and rules are to:

- i) liberalise and facilitate trade in goods and services and expand investment between the Parties;
- ii) establish a cooperative framework for strengthening and enhancing the economic relations between the Parties;
- iii) establish a framework conducive for a more favourable environment for their businesses and promote conditions of fair competition in the free trade area;
- iv) establish a framework of transparent rules to govern trade and investment between the Parties;
- v) create effective procedures for the implementation and application of this Agreement;
- vi) explore new areas of economic cooperation and develop appropriate measures for closer economic partnership between the Parties;
- vii) improve the efficiency and competitiveness of their manufacturing and services sectors and expand trade and investment between the Parties; and

- viii) establish a framework for further regional and multilateral cooperation to expand and enhance the benefits of this Agreement throughout Asia, and thereby, to encourage the economic integration of Asian economies.

4. INDIA-KOREA TRADE

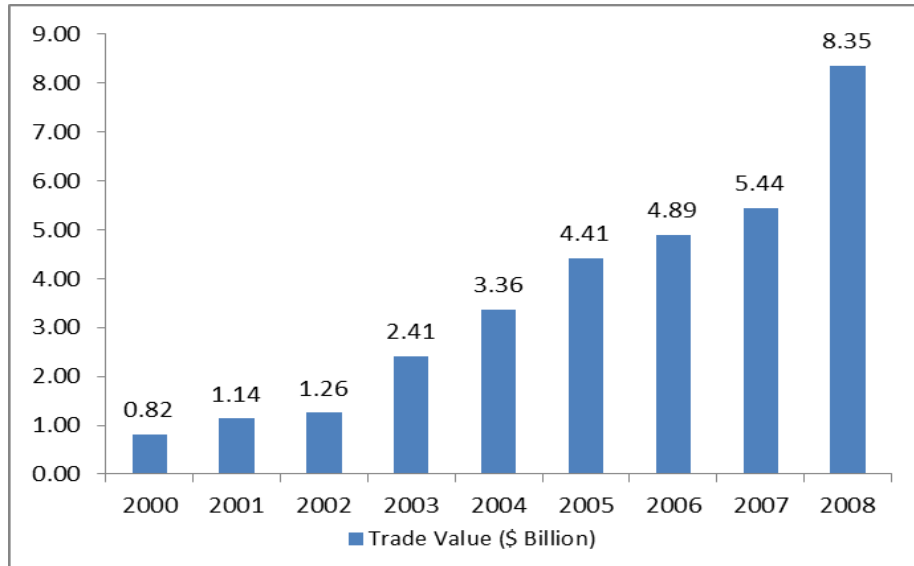
The increase in bilateral trade in goods between the two countries has been attributed to changing demand structure and comparative advantages of both the economies in complementary sectors. The Indian export basket has traditionally consisted of low value added products which shifted over time to a wider range of industrial products in recent years while the Indian import basket from Korea in recent years has mainly consisted of relatively high value added products such as electrical machinery and equipments, nuclear reactors, iron and steel, transport equipments, mineral fuels and their products, organic chemicals, etc. As far as bilateral trade in services is concerned, it has consistently increased in some sectors such as IT/Software and travel services. It is important to highlight that India is the 9th largest exporter of commercial services and Korea is the 11th largest importer of commercial services. The CEPA agreement which gives market access and allows inflows of professionals such as IT workers, engineers, and teachers would be beneficial for India and improve bilateral trade in services.

During 1991-2008, India's total merchandise trade with South Korea has increased at double digit except few years. Total bilateral trade has increased 28 times during this period. It increased from US\$ 0.56 billion in 2001 to US\$ 15.8 billion in 2008. The share of South Korea in India's exports lies in the range of 1% to 3% and imports lies in the range of 1.6% to 3.2% during 1991-2008. The share of India in South Korea's exports lies in the range of 0.65% to 2.10% and imports lies in the range of 0.59% to 1.51% during 1991-2008. Despite increase in trade, it can be seen that the trade intensity for the India has been below optimum while reverse is true for South Korea. The value of trade intensity index for India indicates that the extent of trade

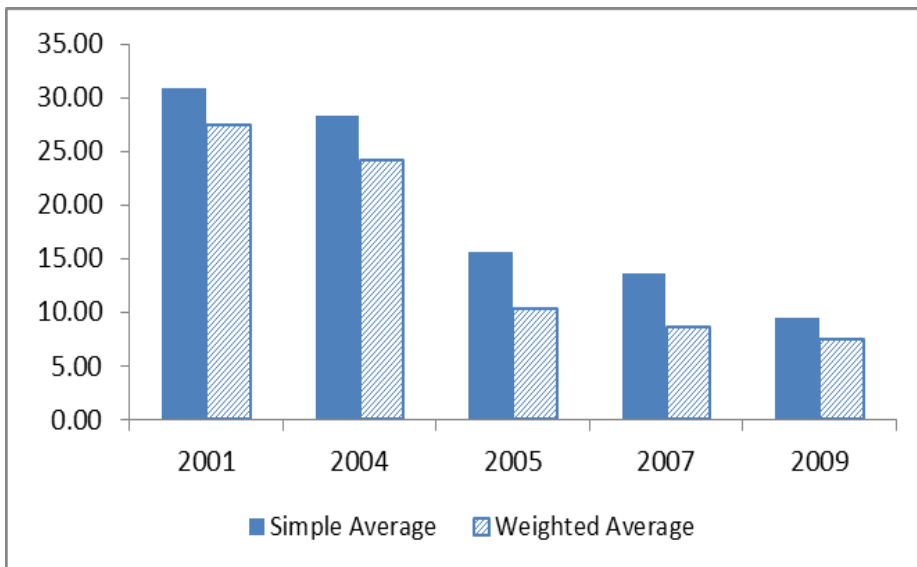
between the economies is low than would be expected on the basis of their importance in world trade. Table A1 in Appendix reveals that trade and export Intensity Index of India (TII) with South Korea is less than 1 and remained so since 1991, except 2008 while TII of South Korea with India is more than 1. TII indicates that India's trade flow is smaller than expected, given the partner country's importance in world trade. This means India's exports and imports are not intense with South Korea compared with its trading pattern with rest of the world (see for details, table 1 and 2 in appendix).

Figure 1 represents Indian imports from South Korea. It shows that India was importing approximately US\$ 0.82 billion in 2000 which has increased to US\$ 8.35 billion in 2008. During this period, Indian tariff rate on imports from South Korea has reduced substantially as well (figure 2). India's imports from South Korea are concentrated in HS chapter 84, 85, 72, 27, 87, 39, 73, 29, 40 and 48 and include commodities like — nuclear reactors, boilers, machinery and mechanical appliances; parts thereof (15.60%), electrical machinery and equipment and parts thereof (15.34%), Iron and steel (13.84%), mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes, etc (9.11%), vehicles o/t railw/tramw roll-stock (9.10%), plastics and Articles thereof, articles of iron or steel, organic chemicals, rubber and articles thereof, paper & paperboard; art of paper, rubber and articles thereof, etc. (figure 3). These products account 81.79% of India's imports from South Korea.

It is important to highlight that most of the India's import items are concentrated in low tariff HS chapters. Figure 4 indicate first 10 HS chapters on the basis of Indian weighted and simple import tariff on Korean products in descending order. The tariff rate lies in the range of 88% to 30%. If we analyze the figure 3 and figure 4 simultaneously, none of the HS chapter is common in the list. It implies that South Korean firms have not penetrated Indian market in high tariff products. Hence, it may be inferred that tariffs act as significant trade barrier.

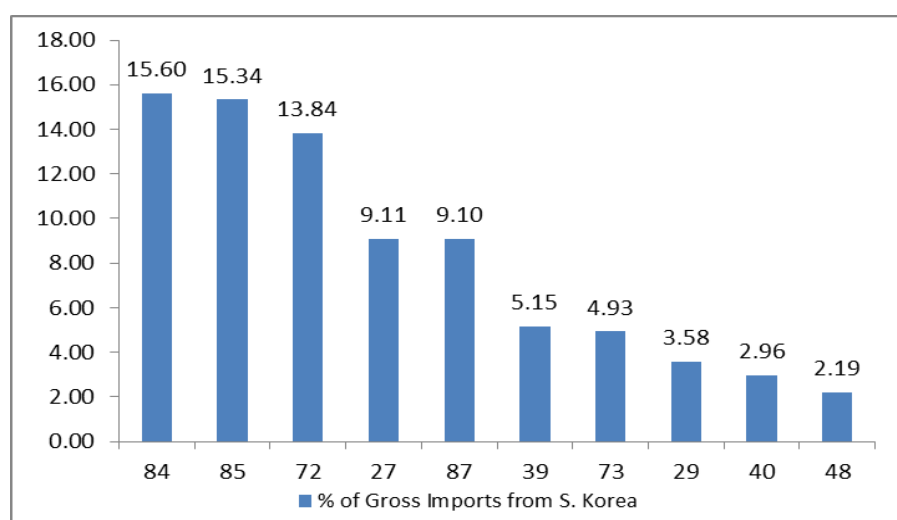
Figure 1 Indian Imports from South Korea (%)

Source: WITS Database (2010).

Figure 2 Indian Tariff Rates on Imports from South Korea

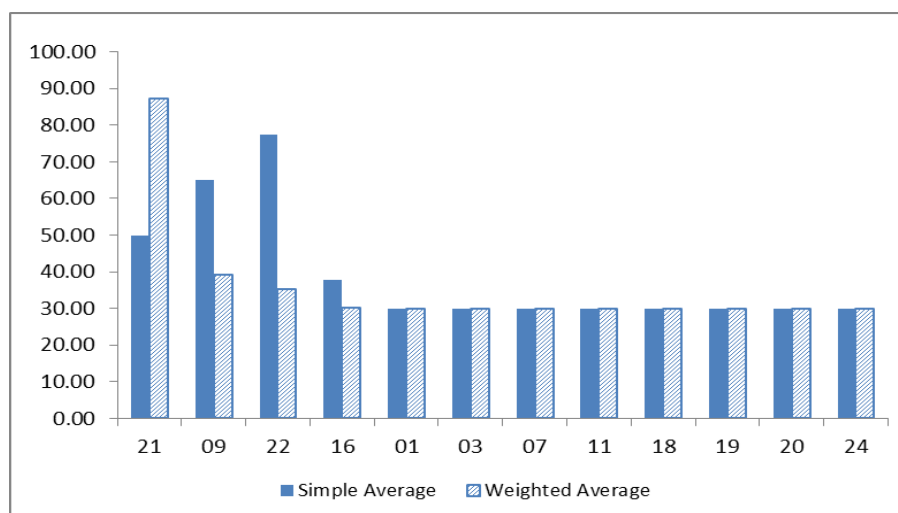
Source: WITS Database (2010).

**Figure 3 Indian Imports from South Korea (% in 2008)
(HS Chapter in Descending Order)**

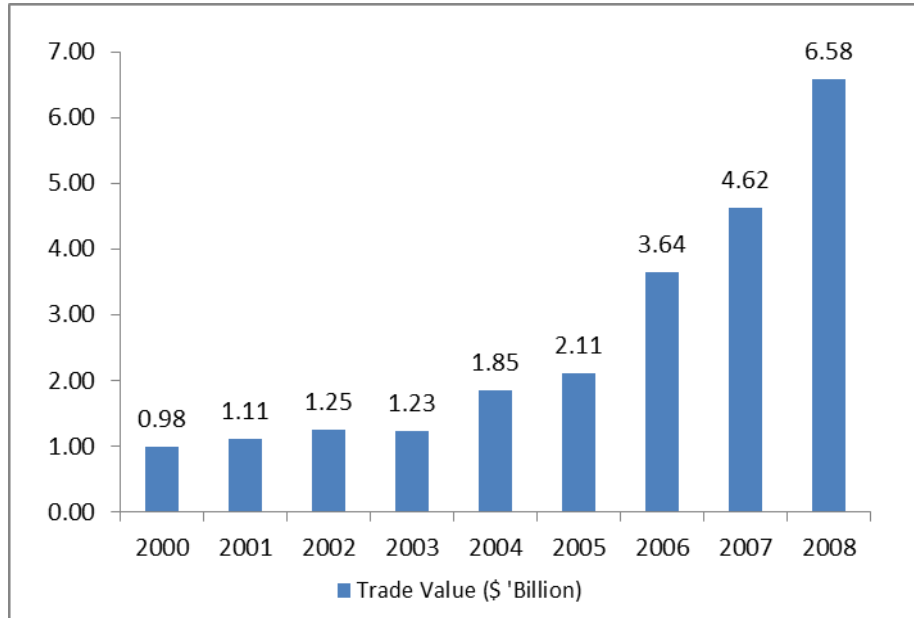


Source: WITS Database (2010).

**Figure 4 Indian Tariff Rates on Imports from South Korea
(% in 2008), (HS Chapter in Descending Order)**



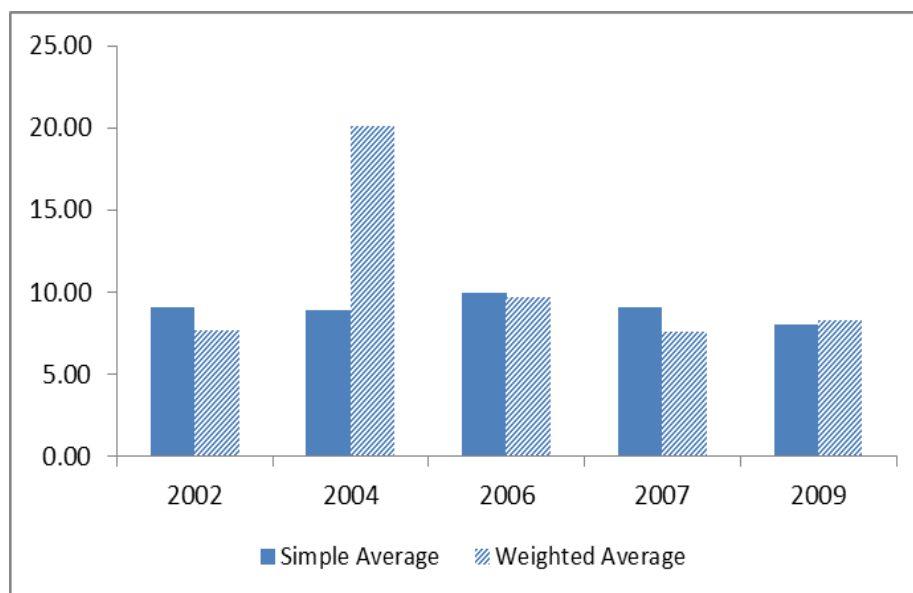
Source: WITS Database (2010).

Figure 5 South Korean Imports from India

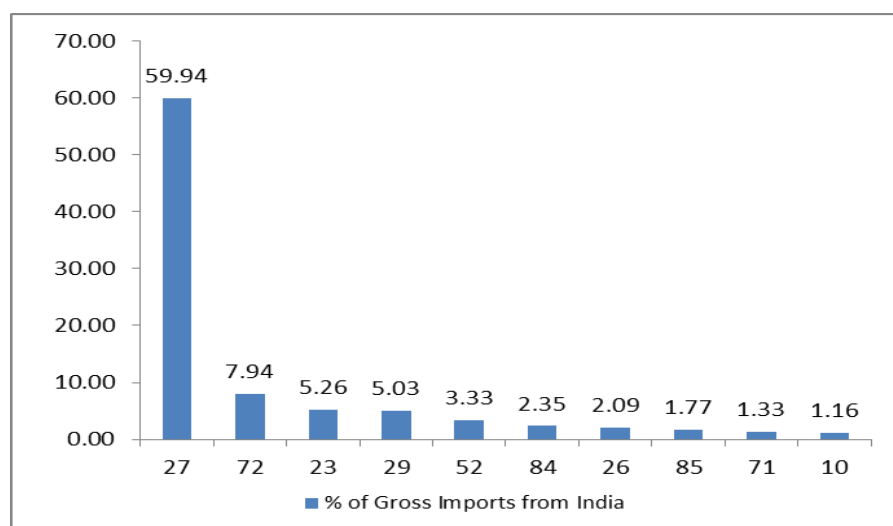
Source: WITS Database (2010).

Figure 5 represents South Korea's imports from India. It shows that South Korea was importing approximately US\$ 0.98 billion in 2000 which has increased to US\$ 6.58 billion in 2008. During this period, South Korean tariff rate on imports from India has declined as well (figure 6). South Korea's imports from India are concentrated in HS chapter 27, 72, 23, 29, 52, 84, 26, 85, 71, and 10 (figure 7). It is important to highlight that HS Chapter 27, i.e., mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes, account 60% of South Korea's imports from India. The products in Chapter 27 faces very low or zero tariff in South Korean Market. It highlights that India exports to South Korea are not diversified.

South Korea's imports from India are also concentrated in low tariff HS chapters. Figure 8 indicate first 10 HS chapters on the basis of South Korea's weighted and simple import tariff on Indian products in descending

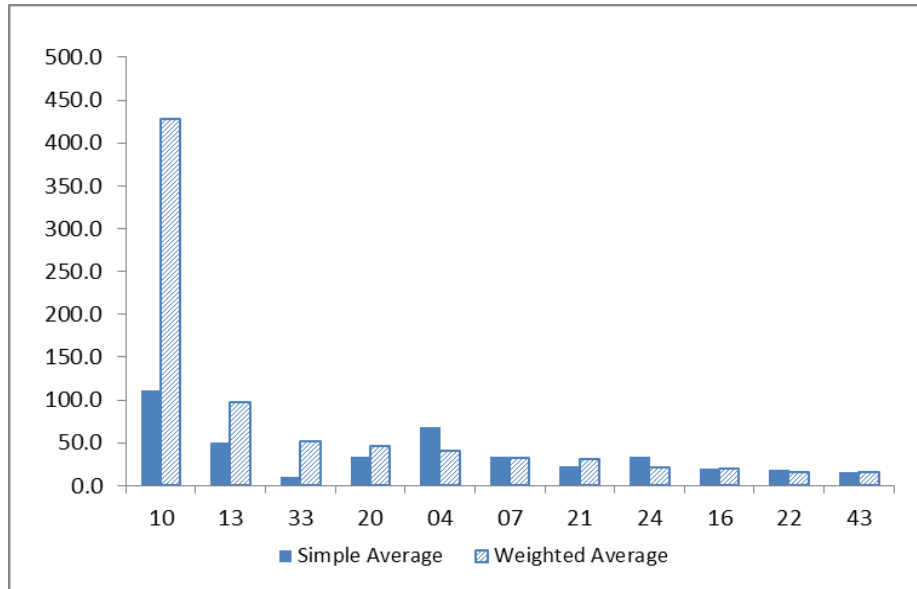
Figure 6 South Korea's Tariff Rates on Imports from India

Source: WITS Database (2010).

**Figure 7 South Korea's Imports from India (% in 2008)
(HS Chapter in Descending Order)**

Source: WITS Database (2010).

**Figure 8 South Korea's Tariff on Imports from India in 2008 (%)
(HS Chapter in Descending Order)**



Source: WITS database (2010).

order. The tariff rate lies in the range of 2% to 428%. Analyzing the figure 7 and figure 8 simultaneously, it seems that Indian exports has not penetrated or marginally in high tariff HS chapters. Hence, it may be inferred that tariffs act as significant trade barrier.

5. METHODOLOGY AND DATABASES

The quantitative analyses in this paper are based on the SMART and GTAP model. SMART is a computable partial equilibrium (CPE) model while GTAP is a computable general equilibrium (CGE) model. Both models are widely used for trade policy analysis. Both models feature their own advantages and disadvantages.

SMART model is a partial equilibrium modeling framework developed by

World Bank/UNCTAD. The main advantage of the partial equilibrium approach to Market Access Analysis is its minimal data requirement. In fact, the only required data for the trade flows, the trade policy (tariff), and a couple of behavioral parameters (elasticities). This can therefore take advantage of the rich WITS datasets which contain all of those. Another advantage (which follows directly from the minimal data requirement) is that it permits an analysis at a fairly disaggregated (or detailed) level. This also resolves a number of “aggregation biases”.

However, the partial equilibrium approach has a number of disadvantages that have to be kept in mind while conducting any analysis. For instance, the partial equilibrium models may miss important interactions and feedbacks between various markets. In particular, the partial equilibrium approach tends to neglect the important inter-sectoral input/output (or upstream/downstream) linkages that are the basis of general equilibrium analyses. It also misses the existing constraints that apply to the various factors of production (e.g., labor, capital, land...) and their movement across sectors.

The general equilibrium methodology provides an analytical framework that allows these inter- and intra-sectoral changes in output mix and by extension the demand for different factors of production to be captured. GTAP is a multi-region computable general equilibrium (CGE) model designed for comparative-static analysis of trade policy issues (Adams *et al.*, 1998).

5.1. Theoretical Framework of SMART Model

The setup of SMART is that, for a given good, different countries compete to supply (export to) a given home market. The focus of the simulation exercise is on the composition and volume of imports into that market. The degree of responsiveness of the supply of export to changes in the export price is given by the export supply elasticity. SMART assumes infinite export supply elasticity — that is, the export supply curves are flat and the

world prices of each variety are exogenously given. This is often called the price taker assumption.

SMART relies on the Armington assumption to model the behavior of the consumer. In particular, the adopted modeling approach is based on the assumption of imperfect substitutions between different import sources (different varieties). That is, goods (defined at the HS 6 digit level) imported from different countries, although similar, are imperfect substitutes.

Within the Armington assumption, the representative agent maximizes its welfare through a two-stage optimization process:

- First, given a general price index, she chooses the level of total spending/consumption on a “composite good”. The relationship between changes in the price index and the impact on total spending is determined by a given import demand elasticity.
- Then, within this composite good, she allocates the chosen level of spending among the different “varieties” of the good, depending on the relative price of each variety. The extent of the between-variety allocative response to change in the relative price is determined by the Armington substitution elasticity.

The SMART model incorporates three kinds of elasticities:

- **Supply Elasticity:** Supply elasticity is the export supply elasticity value. By default, SMART uses 99 for infinite elasticity for all products and partners. This means that an increase in demand for a given good will always be matched by the producers and exporters of that good, without any impact on the price of the good.
- **Substitution Elasticity:** Import substitution elasticities record the rate of substitution between two goods from different origins. The Armington assumption is incorporated, meaning that similar goods from different countries are imperfectly substitutable. The import substitution elasticity is considered to be 1.5 for each good.

- **Import Demand Elasticity:** Import demand elasticity measures the demand response to a shift in import price. Default values are the same for all reporters but may vary by product.

Another important assumption made by the model is perfect competition, which means for example that tariff cuts are fully reflected in the prices paid by consumers (see for details Jammes and Olarreaga, 2005).

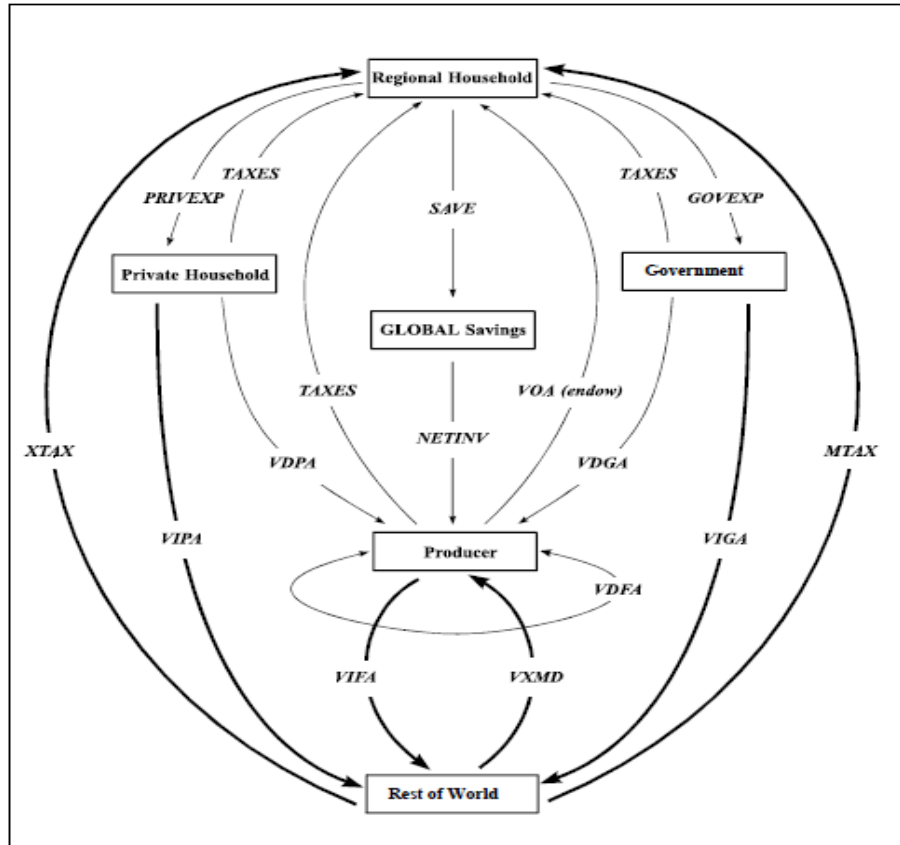
5.2. Theoretical Framework of GTAP Model

GTAP model captures in two types of equations, namely behavioural equations and accounting relationships. The key drivers of the model are the behavioural equations, which are based on microeconomic theory. Accordingly there are behavioural equations for the consumers, producers and also for the international trade (exports and imports). These equations capture the behaviour of the optimizing agents such as the consumers that allows the derivation of the demand functions. The second type of the equations is the accounting relationships. These are essential in order to ensure that the behavioural equations solution occurs within a consistent macroeconomic framework. Thus, the accounting relationships ensure that the receipts and the expenditures of all the agents (consumers, producers, government, rest-of-the-world) are balanced. Hertel (1997) covers in details the theory behind the model and the derivations of the behavioural equations¹⁾ and available on the Internet (<http://www.agecon.purdue.edu/gtap>). For the purposes of this study, these derivations are taken as given and the study simply provides just the broad outline of what the GTAP model is like.

Figure 9 has been reproduced from Brockmeier (2001) to explain the accounting relationships in multi region open economy as captured by GTAP model. The starting point is a regional household associated with each country

¹⁾ Chapter 2 of what has come to be popularly known as the GTAP Book covers the economic theory of the GTAP model.

Figure 9 Multi Region Open Economy



Source: Brockmeier (2001).

or composite region²⁾ of GTAP. This regional household collects all income that is generated in the closed economy. According to a Cobb Douglas, per capita utility function, regional income is exhausted over the three forms of final demand: Private household Expenditures (PRIVEXP), Government Expenditures (GOVEXP) and savings (SAVE). The first component of final demand is private consumption (Value of Domestic Private household

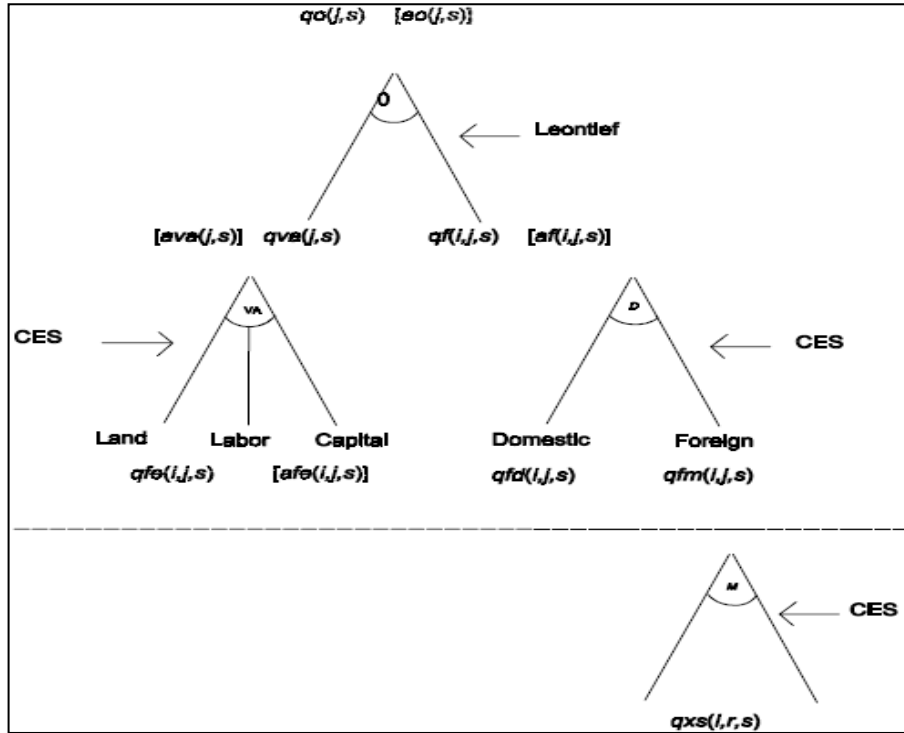
²⁾ A composite region is an aggregation of different countries whose individual disaggregation has not been done in the GTAP database e.g., rest of sub-Saharan Africa is an aggregation of all African countries that are not available in the database as stand-alones.

purchases, evaluated at Agents' prices, VDPA). The constrained optimizing behavior of private consumption is represented in GTAP by the CDE (Constant Difference of Elasticity) implicit expenditure function. The second component of final demand is Government purchases (Value of Domestic Government purchases, evaluated at Agents' prices, VDGA). In order to model the behavior of government spending, a Cobb Douglas sub-utility function is employed in GTAP. In this case the Cobb Douglas expenditure shares are constant across all commodities. Considering the third component of final demand, savings are completely exhausted on investment (NETINV). Regional income consists of the Value of Output at Agent's prices (VOA) paid by producers for the use of endowment commodities to the regional household. At the same time, the producers receive payments for selling consumption goods to the private households (VDPA) and the government (VDGA), intermediate inputs to other producers (Value of Domestic Firm Purchases, evaluated at Agents' prices, VDFA) and investment goods to the savings sector (NETINV). Under the zero profit assumption employed in GTAP, these revenues must be precisely exhausted on expenditures for intermediate inputs (VDFA) and primary factors of production (VOA). TAXES flow from the private household, firms and government to the regional household. Since these value flows include both taxes and subsidies, they denote net tax revenues.

Looking at the multi region open economy, accounting relations are redefined. Firms get additional revenues for selling commodities to the Rest of the World on the one side. These exports are denoted by VXMD. On the other side, the producers now spend their revenues not only on primary factors and domestically produced intermediate inputs, but also on imported intermediate inputs, VIFA. Furthermore, the firms have to pay an additional consumption tax on imported inputs to the regional household. Since this tax expenditure is included in the TAXES flowing from the producer to regional household, the figure 9 does not show any change in this respect. The government and private households not only spend their income on domestically produced but also on imported commodities which are denoted

as VIPA and VIGA, respectively. Finally, we have to check the accounting relationships for the rest of the world. According to the figure 9, the rest of the world gets payments for selling their goods for private consumption, government, and firms. These revenues will be spent on commodities exported from the single region to the rest of the world, denoted as VXMD, and on import taxes, MTAX, and export taxes, XTAX paid to the regional household. This is simplified exposition of multi region open economy in GTAP model. However, readers are advised to refer to Brockmeier (2001) for details.

Each regional sector is assumed to choose a mixture of inputs to minimise total cost for a given level of output. In the derivation of factor inputs demands, the model structure uses constant returns to scale technology and nested constant elasticity of substitution (CES) production functions with three levels. At the first level, producers use composite units of intermediate inputs and primary factors in fixed proportions according to a Leontief function. At the second level of the production nest, intermediate input composites are obtained as combinations of imported bundles and domestic goods of the same input-output class, and primary factor input composites are created as combinations of skilled-labour, unskilled-labour, capital, land, and natural resources. A CES function is used in forming both types of composites. Finally at the third level, imported bundles are created via a CES aggregation of imported goods of the same class from each region. Figure 10 provides a visual display of the assumed technology for firms in each of the industries in the GTAP model. This kind of a production “tree” is a convenient way of representing separable, constant returns-to-scale technologies. For example, the primary factors of production are: land, labour, and capital. Their quantities are denoted $QFE(i, j, s)$, or, in percentage change form, $qfe(i, j, s)$. The quantities in brackets [.] in figure 10 refer to rates of technical change. Firms also purchase intermediate inputs, some of which are produced domestically, $qfd(i, j, s)$, and some of which are imported, $qfm(i, j, s)$. In the case of imports, the intermediate inputs must be “sourced” from particular exporters, $qxs(i, r, s)$. The equations describing the

Figure 10 Production Structure

Source: Hertel (1997).

firm behavior portrayed in figure 10 are provided in Hertel (1997).

On the demand side, the GTAP model adopts a sophisticated specification of consumer behaviour which allows for differences in both price and income responsiveness of demand in different regions, depending on the level of development and regional specific demand patterns. Each region or composite region in GTAP has a single representative household that collects all the regional income. This regional household receives all the income generated through payments to primary factors, and net tax revenue. Its behaviour is governed by an aggregate utility function over private household consumption, government consumption, and savings. The aggregate utility is modeled by a Cobb-Douglas function with constant expenditure shares. The government consumption is also described by a Cobb-Douglas function over

composite commodities where the demand for the latter is a CES aggregation of imports and domestic goods. Private household consumption is explained by a CDE (Constant Difference of Elasticities) expenditure function. These households purchase bundles of commodities where the bundles are CES aggregation of domestic goods and imported bundles. The imported bundles in turn are formed by a CES aggregation of imports from different regions.

Regional governments intervene in their own markets by imposing taxes and subsidies on commodities and primary factors, thus driving wedges between prices paid by purchasers and prices received by producers. These policy interventions are modeled as ad valorem taxes, tariffs and subsidies, or quantitative restrictions in the case of textile and apparel trade. International trade is linked through Armington substitution among goods differentiated by country of origin. Therefore, in markets for traded commodities, buyers differentiate between domestically produced products and imported products with the same name. Product differentiation between imports by region of origin allows for two-way trade across regions in each tradable product.

Investment in each region is financed from a global pool of savings. Each region contributes a fixed proportion of its income to the savings pool. Two alternative ways can be used to allocate the savings pool. The first way is where each region's share increases by the proportion in which aggregate pool increases. The second way is where the investment allocation is done according to the relative rates of return. Regions, which experience increases in their rate of return relative to the global average, will receive increased shares of the investment budget, whereas regions experiencing reductions in their rate of return relative to the global average will receive reduced shares.

In simplified words, GTAP model has many general features which include product differentiation by country of origin, explicit recognition of savings by regional economies, a capital goods producing sector in each region to service investment, international mobility of capital, multiple trading regions, multiple goods and primary factors, empirically based differences in production technology and consumer preferences across regions, and explicit recognition of a global transport sector. There is clear

distinction between those factors that are perfectly mobile and those that are sluggish in adjusting. In the case of the mobile factors, they earn the same market return regardless of the use location. As for the sluggish factors, returns in equilibrium may be different across sectors. It is also featured by many policy variables, including taxes and subsidies on commodities as well as on primary factors, making the model more attractive to policy analysts. In each region both factor and commodity markets are assumed to be perfectly competitive.

The GTAP framework described above relies on country and regional input-output tables as its database. More specifically, the GTAP database comprises: input-output data for each region, bilateral trade data derived from United Nations trade statistics; and support and protection data derived from a number of sources. For this paper, we used version 7 of the GTAP database, covering 113 countries/regions and 57 sectors, with a base year of 2004. All the trade flows for the 57 commodity categories are distinguished by their countries/regions of origin and destination, and on the basis of agents such as intermediate demand, final demand by private households, government and investment. It provides a method for allowing for varying import intensities by different economic agents within a country/region. In the present simulation, 113 countries/regions in GTAP database are aggregated into 4 countries/regions. Details of regional aggregation are presented in table A3 in Appendix.

5.3. Simulation Scenarios

- To examine the potential trade flows as result of tariff removal by India and Korea on imports from each other in SMART Model, 100% tariff cut by each country has been simulated. Each country is being considered separately.
- To examine the potential trade flows as result of tariff removal by India and Korea on imports from each other in GTAP Model, 100% tariff cut

simultaneously by India and Korea on imports from each other has been simulated. These simulations are undertaken on the basis of standard book closures. The outcomes of the simulations are reported in terms of its effect on welfare for overall assessment.

6. SIMULATION OUTCOMES

6.1. SMART Model Results

One of the main justifications of liberalization is to reduce the price paid by consumers, increasing thus their purchasing power. So, our main objective is to analyze as accurately as possible consumers' potential gain. Further, product-specific tariff revenues and trade effects has also been estimated. We choose to simulate the impact of a complete dismantlement of tariffs in order to clearly expose the effects of trade liberalization on all products. This is therefore an "extreme scenario" which aims at delineating the general trends of the impact of liberalization of both economies under the CEPA.

India's trade gains as result of South Korea's tariff reduction indicate an increase about US\$ 5.7 billion. The first 25 tariff lines on the basis of total trade effects in descending order are presented in the table 1. The maximum gain of India in HS product at 6 digit level are light oils and preparations (271011), maize (corn), other than seed (100590), Cashew nuts, shelled (80132), smoking tobacco, whether or not containing tobacco substitutes in any proportion (240310), machinery for liquefying air/other gases, whether/not electrically heated (841960) and tobacco partly or wholly stemmed or stripped (240120). Approximately 6% is the trade diversion effect. However, there is significant trade diversion in some of these tariff lines from United States, Brazil, Vietnam, China, Indonesia, Spain, Australia, Japan, Israel, and Germany. For instance, HS 6 digit tariff line 100590, 240120, 720230, 230400, 130219, and 840734 indicate trade diversion around

Table 1 India's Export as Result of Korea's Tariff Reduction

HS Code	Trade Total Effect (\$'000)-TTE	Trade Diversion Effect (\$ '000)-TDE	Trade Creation Effect (\$ '000)	TDE as a % of TTE	Most Affected Country
Total	6,059, 427	-377,453	5,681,972.57	6.22	-
271011	5,454,725.81	113,446.89	5,341,278.93	2.08	-
100590	233,146.29	157,526.35	75,619.94	67.57	United States
80132	66,152.40	42.548	66,109.85	0.06	-
240310	57,749.69	470.091	57,279.60	0.81	-
841960	22,816.08	150.844	22,665.24	0.66	-
240120	21,780.11	6,556.66	15,223.45	30.10	Brazil
520523	10,370.11	3,163.85	7,206.26	30.51	Vietnam
271119	8,222.29	403.887	7,818.41	4.91	-
720230	6,722.67	3,235.41	3,487.26	48.13	China
230400	6,448.61	3,597.25	2,851.36	55.78	Brazil
130219	5,676.28	3,213.47	2,462.80	56.61	China
711299	4,978.13	2,265.84	2,712.29	45.52	Indonesia
330190	4,275.86	2,155.56	2,120.30	50.41	Spain
840734	3,786.74	2,474.12	1,312.62	65.34	Australia
151530	3,548.43	100.623	3,447.80	2.84	-
270730	3,300.97	2,063.28	1,237.70	62.51	Japan
520524	3,142.35	1,963.23	1,179.12	62.48	China
294190	3,014.22	1,840.34	1,173.88	61.06	China
710239	2,899.93	594.769	2,305.16	20.51	Israel
520522	2,660.21	1,354.93	1,305.28	50.93	China
293090	2,616.09	1,447.83	1,168.26	55.34	Japan
320417	2,574.48	1,795.31	779.174	69.73	Japan
840999	2,518.97	1,497.16	1,021.81	59.44	Germany
847989	2,337.41	1,376.97	960.442	58.91	Japan
730721	2,234.55	1,025.21	1,209.33	45.88	China

67.57%, 30.10%, 48.13%, 55.78%, 56.61% and 65.34% of total trade effects as result of South Korea's 100% tariff reduction on imports from India. The 25 HS products listed in table capture 98% of India's export gains. The maximum gains are concentrated in high tariff products in South Korean market (table 2).

Trade effects as result of India's tariff reduction predict an increase in South Korea's exports to India of US\$ 1.823 billion and reported in table 3. The maximum gain of South Korea in HS product at 6 digit level are in vehicles principally designed for the transport of persons (870332), line pipe of a kind used for oil or gas pipelines, having internal and external circular cross-sections (730512), petroleum oils and oils obtained from bituminous minerals, etc (271019), other parts & accessories for the motor vehicles of 87.01-87.05, excluding 8708.91/92/93/94/95 (870899), flat-rolled products of iron or non-alloy steel, of a width of ≥ 600 mm, in coils, simply hot-rolled, not clad (720836), newsprint, in rolls or sheets (480100), unbalance motors, rubber buffers, coil springs, leaf springs, crank shaft drive and fuses (847989). Approximately 25% is the trade diversion effect in the increase in South Korean exports. However, there is significant trade diversion some of these tariff lines from Germany, Singapore, Italy, Thailand, Sweden, China, Canada, Japan, Russian Federation and Mexico. For instance, HS 6 digit tariff line 870899, 271019, 480100 reveal trade diversion around 93.79%, 29.61%, 48.35% of total trade effects as result of India's 100% tariff reduction on imports from south Korea. The 25 HS products listed in table capture 63% of South Korea's export gains. The maximum gains are concentrated in high tariff products in Indian markets (table 4).

SMART simulation results reveal positive consumer's surplus gains for India and South Korea. The results are reported in table 5. India's consumer's surplus will be increasing by US\$ 317.8 million while consumer's surplus in South Korea will be increasing by US\$ 452.8 million. The maximum consumer surplus gains for Indian consumers are concentrated in other vehicles, with compression-ignition internal combustion piston engine (870332), line pipe of a kind used for oil or gas pipelines, having internal

Table 2 India's Export Interest in South Korea

HS Tariff Line Code	Exports	Exports	Export
	Before (\$ '000)	After (\$ '000)	Change (\$ '000)
271011	3,889,482.85	9,344,208.66	5,454,725.81
100590	76,421.06	309,567.36	233,146.29
80132	4,801.67	70,954.06	66,152.40
240310	988.385	58,738.07	57,749.69
841960	1,394.70	24,210.78	22,816.08
240120	30,559.07	52,339.18	21,780.11
520523	98,466.96	108,837.07	10,370.11
271119	5,749.70	13,971.99	8,222.29
720230	56,794.98	63,517.65	6,722.67
230400	173,449.80	179,898.40	6,448.61
130219	3,468.20	9,144.47	5,676.28
711299	45,211.94	50,190.07	4,978.13
330190	6,328.73	10,604.59	4,275.86
840734	23,870.57	27,657.31	3,786.74
151530	8,281.55	11,829.97	3,548.43
270730	49,453.47	52,754.44	3,300.97
520524	27,270.93	30,413.28	3,142.35
294190	29,961.58	32,975.80	3,014.22
710239	40,761.73	43,661.66	2,899.93
520522	19,541.08	22,201.29	2,660.21
293090	19,457.35	22,073.44	2,616.09
320417	18,119.11	20,693.60	2,574.48
840999	28,563.82	31,082.79	2,518.97
847989	12,117.33	14,454.74	2,337.41
730721	10,018.20	12,252.74	2,234.55
Change in Export Revenue in First 25 Tariff Lines			5,937,699
Total			6,059,427
% of Total			97.99

Table 3 Korea's Export as Result of India's Tariff Reduction

HS Code	Trade Total Effect (\$ '000)-TTE	Trade Diversion Effect (\$ '000)-TDE	Trade Creation Effect (\$ '000)	TDE as a % of TTE	Most Affected Country
Total	2,425,531.24	-601,783.31	1,823,747.94	24.8	-
870332	515,438.81	59,570.06	455,868.75	11.56	Germany
730512	299,170.94	428.063	298,742.87	0.14	-
271019	130,341.39	38,588.73	91,752.66	29.61	Singapore
870899	65,948.20	61,850.74	4,097.47	93.79	Italy, Japan, Thailand, Sweden
720836	62,182.11	8,253.15	53,928.96	13.27	China
480100	39,111.88	18,910.46	20,201.42	48.35	Canada
350691	34,708.20	427.037	34,281.17	1.23	-
847989	32,363.73	13,446.97	18,916.76	41.55	Japan
841810	27,735.07	681.154	27,053.92	2.46	-
870829	26,595.55	6,290.91	20,304.63	23.65	Japan
890120	25,344.31	1,914.02	23,430.29	7.55	-
720916	23,829.09	1,915.32	21,913.77	8.04	-
852871	23,622.17	6,721.92	16,900.24	28.46	China
410792	22,602.86	321.136	22,281.73	1.42	-
730890	22,375.29	8,149.46	14,225.84	36.42	China
840490	21,798.21	3,719.29	18,078.92	17.06	Russian Federation
870830	19,466.73	2,767.51	16,699.22	14.22	Japan
841989	19,312.81	2,618.01	16,694.80	13.56	China
390410	18,512.62	7,601.31	10,911.31	41.06	Japan
840820	18,029.02	968.298	17,060.73	5.37	-
890190	16,732.30	9,696.90	7,035.40	57.95	Russian Federation
400219	16,644.42	5,491.64	11,152.78	32.99	Mexico
846299	14,849.77	2,766.18	12,083.59	18.63	Japan
870410	14,836.65	69.777	14,766.87	0.47	-
870894	14,381.49	3,701.12	10,680.36	25.74	Japan

Table 4 Export Interest of Korea, Republic in India

Tariff Line Code	Exports	Exports	Export
	Before (\$ '000)	After (\$ '000)	Change in Export Revenue (\$ '000)
870332	45,949.81	561,388.62	515,438.81
730512	55,084.72	354,255.66	299,170.94
271019	768,983.24	899,324.62	130,341.39
870899	1,130,916.84	1,196,865.05	65,948.20
720836	208,208.08	270,390.20	62,182.11
480100	172,364.31	211,476.18	39,111.88
350691	3,341.79	38,050.00	34,708.20
847989	150,419.62	182,783.35	32,363.73
841810	7,455.36	35,190.43	27,735.07
870829	57,483.42	84,078.97	26,595.55
890120	430,408.38	455,752.69	25,344.31
720916	47,223.26	71,052.35	23,829.09
852871	61,196.55	84,818.72	23,622.17
410792	3,988.96	26,591.82	22,602.86
730890	67,326.35	89,701.64	22,375.29
840490	88,626.90	110,425.11	21,798.21
870830	25,774.75	45,241.48	19,466.73
841989	28,084.90	47,397.71	19,312.81
390410	96,772.87	115,285.49	18,512.62
840820	9,007.07	27,036.10	18,029.02
890190	133,187.57	149,919.87	16,732.30
400219	119,873.63	136,518.05	16,644.42
846299	32,938.51	47,788.29	14,849.77
870410	547.512	15,384.16	14,836.65
870894	39,549.62	53,931.10	14,381.49
Change in Revenue in First 25 Tariff Lines			1,525,934
Total			2,422,074
% of Total			63.00%

Table 5 Consumer Surplus Gains as Result of Tariff Reduction

Consumer Surplus Gains for India		Consumer Surplus Gains for South Korea	
HS Code	Welfare (\$ '000)	HS Code	Welfare (\$ '000)
Total	317,797.31	Total	452,846.66
870332	231,360.03	100590	306,820.15
730512	14,873.12	271011	110,513.89
271019	3,434.61	240310	17,246.47
350691	2,677.28	130219	4,268.94
720836	1,986.85	240120	2,248.44
480100	1,779.55	80132	2,072.00
870829	1,758.54	841960	1,488.09
240220	1,640.92	330190	981.855
841810	1,621.44	210690	415.129
852871	1,417.80	271119	383.166
870830	1,397.58	520523	361.16
410792	1,346.89	200819	276.037
847989	1,310.01	160420	214.918
840820	1,300.60	720230	154.408
730890	1,256.66	151530	147.976
890120	1,203.71	40690	142.303
841989	1,165.97	850231	113.872
870410	985.556	350110	113.201
870840	961.63	170211	111.694
840490	948.675	40410	102.748
730900	940.416	840734	100.552
210390	923.399	711299	98.325
730830	867.095	30379	94.807
870894	857.005	870332	94.462
846299	807.998	730721	90.412

Table 6 Revenue Loss as Result of Tariff Reduction

India		South Korea	
HS Code	Revenue Effect (\$ '000)	HS Code	Revenue Effect (\$ '000)
Total	-768,368.17	Total	-1,232,610.56
870899	-119,271.94	100590	-1,002,854.49
870332	-105,519.86	271011	-106,744.80
890120	-43,232.24	130219	-12,275.49
271019	-33,200.18	520523	-8,130.47
480100	-19,122.65	240120	-7,198.85
890190	-14,288.31	330190	-5,849.59
847989	-13,084.01	230400	-3,186.85
400219	-12,536.53	720230	-3,001.52
720836	-10,823.06	230690	-2,532.52
852990	-9,025.65	520524	-2,338.73
720917	-8,459.45	870423	-2,213.98
390410	-8,349.88	840734	-2,107.58
730890	-7,517.97	711299	-1,819.98
840490	-7,387.63	210690	-1,799.88
852871	-6,791.85	294190	-1,696.25
820730	-6,645.46	520522	-1,671.68
870829	-6,377.42	520526	-1,632.71
847990	-5,907.22	320417	-1,593.15
842952	-5,808.82	270730	-1,545.50
730512	-5,543.15	293090	-1,305.08
730791	-5,469.72	840999	-1,188.51
310530	-4,735.28	350110	-1,177.37
870894	-4,325.07	870120	-1,148.89
720837	-4,303.41	200819	-1,143.63
841430	-4,211.79	847989	-1,113.23

and external circular cross-sections (730512), petroleum oils and oils obtained from bituminous minerals, etc (271019) while South Korea will be gaining consumer surplus in maize (corn), other than seed (100590) and light oils and preparations (271011).

SMART simulation results also reveal that India's revenue loss will be US\$ –768.4 million while South Korea may lose revenue about US\$ – 1,232.6 million in case of perfect tariff liberalization (table 6). Given the development needs, India must consider revenue loss and in order to tamper the losses in budget revenues, India should seek to diversify its tax base and develop alternative less distortionary revenue generating strategy. India will be losing maximum revenue in the imports of other parts & accessories for the motor vehicles of 87.01-87.05, excluding 8708.91/92/93/94/95 (870899) and vehicles principally designed for the transport of persons (870332) while South Korea might be losing maximum tariff revenue in the imports of maize (corn), other than seed (100590) and light petroleum oils and preparations (271011).

6.2. GTAP Model Results

GTAP analysis has been used to examine the overall assessment in terms of welfare. The results for welfare effects are reported in table 7. In GTAP, welfare effects are measured using the equivalent variations (EV) (Ahmed, 2009). There are positive welfare gains for South Korea (US\$ 422.8 million) while India is going to have a welfare loss equal to US\$ –113.4 million. In this scenario, net global welfare decreases by US\$ –319 million. Terms of trade improves significantly for South Korea. India's large welfare loss may be due to 'allocative inefficiency'. Welfare loss can also be explained by the fact that India is likely to face a large negative trade diversion effect out of this FTA which will offset the positive trade creation effect.

Results from simulation models are sometimes highly dependent on parameter values such as substitution elasticities. In GTAP, the values of key economic parameters in the disaggregated database are derived from a survey

Table 7 Welfare and its Components (US\$ Millions)

Country Groups	Allocative Efficiency Effects	Change in Terms of Trade	Change in Capital Stock	Total
India	-309.2	191.6	4.2	-113.4
South Korea	14.6	518.8	-110.6	422.8
DevelCount	13.7	-311	47.2	-250.1
RestofWorld	-32.1	-405.5	59.4	-378.3
Total	-313	-6.1	0.1	-319

**Table 8 Systematic Sensitivity Analysis
Welfare Changes (US\$ Millions)**

Country Groups	ESUBD (+/- 50% Shock)					ESBVA (+/- 50% Shock)				
	Default	Mean	SD	95 % C.I.		Default	Mean	SD	95 % C.I.	
India	-113.4	-110.2	139.4	-737.4	516.9	-113.4	-113.6	3.9	-1,167.1	245.3
South Korea	422.8	445.6	27.7	321.1	570.1	422.8	422.5	7.6	321.4	570.9
Devel Count	-250.1	-256.6	58.1	-518.2	5.0	-250.1	-248.9	6.1	-507.4	1.9
Rest of World	-373.0	-380.2	42.1	-569.6	-190.7	-373.0	-373.8	5.4	-610.9	-172.8

of econometric work. Such estimates are most appropriately viewed as random. To address this issues, we conduct formal systematic sensitivity analysis (SSA) using the multivariate order three Gaussian Quadrature (GQ) procedure. This analysis is an attempt to show how uncertain we are about modeling results given that there is some uncertainty over model inputs. It is a way of testing the robustness of the model results to these inputs.

The SSA results summarize the estimates of the mean ($\hat{\mu}_{EV}$) and standard deviation ($\hat{\sigma}_{EV}$) of welfare results (E.V.) for South Korea and India. The

95% confidence intervals are constructed using Chebyshev's Inequality ($\hat{\mu}_{EV} - 4.5\hat{\sigma}_{EV}, \hat{\mu}_{EV} + 4.5\hat{\sigma}_{EV}$). The SSA results are reported in table 8. The SSA results for (+/-) 50% shock around the default value of ESUBD and ESUBVA indicate that welfare for India may have mixed direction depending on parameter values, with greater probability of negative side. Further, SSA analysis indicates that welfare gains for South Korea will remain positive irrespective of parameter values. Hence, the welfare gains for South Korea are more stable compared to India in case of free trade in Goods.

7. UNTAPPED INVESTMENT OPPORTUNITIES

As discussed above, India has limited scope in trade in goods. In this scenario, India may gain in terms of South Korean investment inflows in India as result of this CEPA. However, it is difficult to examine the effect of India-Korea CEPA on FDI inflows since CEPA became effective recently. It is also not possible to predict investment outcome using SMART and GTAP model as predicted in case of trade in goods. Hence, the best way to gauge the probable effect of CEPA is to examine the India's experience with FDI with other bilateral FTAs or CEPA. So far India signed free trade agreements (FTAs) with Sri Lanka, SAFTA and recently with ASEAN. At the same time it concluded the Comprehensive Economic Cooperation Agreement (CECA) with Singapore and recently with South Korea. Hence, an attempt has been made to assess the impact of India-Korea CEPA on FDI inflows using approach of case study based method.

7.1. India-Sri Lanka FTA and FDI

The FTA between India and Sri Lanka came into full existence from 1st March 2000. This FTA was the first among the new age preferential trade arrangements that India signed. This is reflected in significant flows of

investments from India to Sri Lanka, including export-oriented investments by Indian companies in Sri Lanka. The increase of Indian investments to Sri Lanka has been a more visible indirect benefit of the India-Sri Lanka FTA. Nearly a 100 Indian companies are currently operating in Sri Lanka. A typical example is an investment made by an Indian tyres company, CEAT to set up a large export-oriented tyres plant in Sri Lanka to cater to its growing markets in Pakistan, Middle East and other countries taking advantage of abundant supply of natural rubber in the country (Kumar, 2007). India is now the country's second largest investor; investing US\$ 126 million in 2008, second only to Malaysia (which invested US\$ 150 million in 2008). This is a contribution of 14% of total FDI inflows to Sri Lanka, and is a marked increase from the previous investment levels during 1978-1995 which amounted to just 1.2% of total investments. An example of a recent Indian investment success story has been the entry of Piramal Glass (acquisition of Ceylon Glass Company), which is now not only catering to the Sri Lankan market but has also begun exporting nearly 70% of their output to the Indian market. Indian Oil Corporation, Taj Hotels, Apollo Hospitals, L & T, Ambujas, Tatas and Ashok Leyland are among the prominent Indian companies operating in Sri Lanka. Power Grid Corporation of India Ltd, National Thermal Power Corporation, Lanka India Oil Corporation (Lanka IOC), Cairn Lanka Pvt Ltd, Lanka Ashok Leyland, and Mphasis are now devising plans making massive investments to expand their businesses in the island. At the same time, Sri Lankan investments in India too have increased, and include areas such as garments, confectionaries, hotels and furniture, with some of Sri Lanka's top blue chip companies opening up ventures there (e.g., Brandix, MAS, Aitken Spence, John Keells) (Jayaratne, Tuesday, March 9, 2010).

7.2. SAFTA and FDI

SAFTA came into effect on 1 January 2006. The potential effect of SAFTA on FDI is also highlighted in the ADB/UNCTAD (2008) study

which indicates that lower intra-regional tariffs will attract FDI from outside the region. It estimates that 30% of the rise in inward FDI may be due to the lowering of intra-regional tariffs. This indicates that SAFTA may encourage FDI inflows into individual member countries and consequently into the region as a whole. SAFTA offers opportunities for increased intra-regional investment, either as direct investment by partner country companies or in joint ventures with local entrepreneurs of the host country. FDI statistics also reveal increasing FDI flows within SAFTA region. Sri Lanka has emerged as the third major source of FDI of Bangladesh. Sri Lanka is behind only to the US and South Korea in relation to the foreign direct investment in Bangladesh (Colombo Page, 2010). India is the top investor in Nepal, followed by the US and China. India contributes about 38% of total foreign investment in Nepal (Sahoo, Tuesday, Nov. 16, 2010).

There are vast differences in terms of the technological sophistication of these economies. The Global Competitiveness Report 2010-11 reports that India leads the group and is ranked 51st followed by Sri Lanka (62), Bangladesh (107), Pakistan (123), and Nepal (130). Dissimilarities increase in the category of “efficiency enhancing factors”. These dissimilarities create strong possibilities for domestic market-seeking as well as efficiency-seeking FDI. Similar argument was put forward by Aggrawal (2008). Mukherjee (2005) shows that revealed comparative advantage of South Asian countries in services differ across sectors. There are thus enormous openings for vertical FDI by firms both from within the partner countries and from outside the RTA. As a whole, the available literature indicate positive outcome of SAFTA.

7.3. India-Singapore CECA and FDI

India-Singapore Comprehensive Economic Cooperation Agreement (CECA) was signed in 2005. FDI from Singapore to India has taken place in various sectors of the country like transportation industries, fuel and electrical equipments. Many Singapore firms such as Singtel, Temasek

Holdings, and Singapore Technologies Telemedia have made investments in the country. Following the signing of CECA, number of Indian companies has reportedly set up bases in Singapore to expand into East Asian region. The emerging pattern of industrial restructuring is best illustrated by the acquisition of NatSteel, Singapore by Tata Steel of India recently and the emerging pattern of supply chain integration. This way the synergy or the locational advantages of India emanating from the iron ore deposits will be available to the NatSteel plants and their specialization for some special steels to Tata Steel will be exploited for mutual advantage. Presently, the total FDI inflows from Singapore to India between 1991 and 2009 (November) amounts to \$9.7 billion. The country ranks second in FDI inflows to India. The key sectors attracting FDI inflows include — service, petroleum and natural gas, computer software and hardware, telecom and mining (The Financial Express, June 11, 2010).

7.4. India-Korea CEPA and FDI

South Korean companies are already having major investments in India with an estimated investment of \$2.7 billion and presence of over 50 companies here. The CEPA will encourage more Korean investments in consumer goods and physical infrastructure and construction sectors (Jose, 2010). Following the signing of the India-Korea CEPA, Korea should increase direct investments in India. India can be used as a “beachhead for Korea” to facilitate its exports to Europe, Africa and the Middle East. India is suffering from a huge trade deficit so it is in dire need of an export-oriented manufacturing base. This is a win-win situation for both Korea and India, if Korea makes direct investments aimed at using India’s cheap but excellent manpower (Baburajan, 2009).

Recently, India has liberalized and consolidated FDI policy for boosting FDI inflows. FDI is freely permitted in almost all sectors except a handful of industry sectors in which no FDI or limited FDI is permitted — these tend to be “sensitive” sectors. In the limited number of sectors/activities requiring

prior government approval, proposals for FDI are considered by the government on the recommendation of the Foreign Investment Promotion Board (FIPB) in a time bound and transparent manner. Under the Foreign Direct Investments (FDI) Scheme, investments can be made by non-residents through two routes; the Automatic Route and the Government Route. Under the Automatic Route, the foreign investor or the Indian company does not require any approval from the Reserve Bank or Government of India for the investment. Under the Government Route, prior approval of the Government of India, Ministry of Finance, and Foreign Investment Promotion Board (FIPB) is required. In sectors which are not reflected in the prohibited list or in the Sector-specific policy, FDI is permitted up to 100% through the automatic route.

The main sectors attracting FDI from South Korea are transportation industry accounting for over 1/3rd of the share, fuels (power & oil refinery), electrical equipment (computer software & electronics), chemicals (other than fertilizer) and commercial, office & household equipments. There are large numbers of untapped opportunities for South Korean firms in India. Few Sectors are discussed below:

Oil & Gas Industry: India's domestic demand for oil and gas is on the rise and country always has excess demand scenario. India is also emerging as the global hub for oil refining with capital costs lower by 25% to 50% over other Asian countries. In this sector, the government of India has been taking many progressive measures to create a conducive policy and regulatory framework for attracting investments. According to the Investment Commission of India, the total opportunity in the oil and gas sector is expected to reach US\$ 35 billion to US\$ 40 billion by 2012 (IBEF, 2010).

Infrastructure Sector: Infrastructure investment in India is set to grow dramatically. According to investment banking company Goldman Sachs, India's infrastructure sector will require US\$ 1.7 trillion investment in the next 10-years in ports, airports, railroads, roads, etc (IBEF, 2010). In a

recent development, Korea Land Corporation (KLC), an agency of the South Korea Government, signed a memorandum of association (MOA), to set up an industrial park and technology zone in Gujarat Vittal Innovation City (GVIC), a multi-product special economic zone (SEZ) being jointly developed by Gujarat Industrial Development Corporation (GIDC) and GVIC (Baburajan, 2009).

Tourism & Hospitality Sector: As per the Travel and Tourism Competitiveness Report 2009 by the World Economic Forum, India is ranked 11th in the Asia Pacific region, 14th best tourist destination for its natural resources and 24th for its cultural resources, with many World Heritage sites, both natural and cultural, rich fauna, and strong creative industries in the country. The demand for travel and tourism in India is expected to grow by 8.2% between 2010 and 2019 and will place India at the third position in the world (Tourism Satellite Accounting (TSA), 2009). The report forecasts India to get capital investment worth US\$ 94.5 billion in the travel and tourism sector in 2019 (IBEF, 2010).

Healthcare Industry: In recent years, the healthcare industry in the country, which comprises hospital and allied sectors, is projected to grow by 23% per annum and expected to touch US\$ 77 billion by 2012 from the current estimated size of US\$ 35 billion (Yes Bank/ASSOCHAM report, 2009). As per FICCI-Ernst and Young report, India needs an investment of US\$ 14.4 billion in the healthcare sector by 2025, to increase its bed density to at least two per thousand populations. The fast growth in the Indian healthcare sector has created various pockets of opportunities for investors.

Textiles Industry: A leading sector in the Indian economy, textiles contributes 14% to industrial production, 4% to the GDP and around 17% to the total export earnings. It is, in fact, the largest foreign exchange earning sector in the country. India has certain natural advantages which has propelled the growth of its textiles Industry. The increase in the domestic market and exports has led to increased investment inflows into the sector. By 2012, investment in the textiles and clothing industry is estimated to touch US\$ 38.14 billion (IBEF, 2010).

Automobile Sector: Automobiles have been kept outside the ambit of tariff elimination but there is continuous support and encouragement for FDI. The growth of the Indian middle class along with the growth of the economy over the past few years has attracted global auto majors to the Indian market. Moreover, India provides trained manpower at competitive costs making India a favoured global manufacturing hub. The attractiveness of the Indian markets on one hand and the stagnation of the auto sector in markets such as Europe, US and Japan on the other have resulted in shifting of new capacities and flow of capital to the Indian automobile industry. Korean car giant Hyundai are increasingly banking on their Indian operations to add weight to their businesses, even as numbers stay uncertain in developed markets due to economic recession and slowdown. Hence, there is still huge untapped potential for Investment.

Auto Components: According to the Investment Commission of India, India is among the most competitive manufacturers of auto components in the world. India is also becoming a global hub for research and development (R&D). Companies like Daimler Chrysler, Bosch, Suzuki and Johnson Controls have set up development centres in India. Many international auto-component majors including Delphi, Visteon, Bosch and Meritor have set up operations in India. Auto manufacturers including GM, Ford, Toyota, etc. as well as auto component manufacturers have set up International Purchasing Offices (IPOs) in India to source for their global operations (VGP, 2008). The government has taken many initiatives to promote foreign direct investment (FDI) in the industry such as automatic approval for foreign equity investment up to 100% of manufacture of automobiles and components is permitted, the automobile industry is delicensed and import of components is freely allowed.

Aviation Industry: The Indian aviation industry is one of the fastest-growing aviation industries in the world with private airlines accounting for more than 75% of the sector of the domestic aviation market. FDI up to 100% is allowed under the automatic route for Greenfield projects in this sector. For existing projects, FDI up to 100% is allowed; while investment

up to 74% under the automatic route and beyond 74% under the government route. Investment opportunities of US\$ 110 billion are being envisaged up to 2020 with US\$ 80 billion towards new aircraft and US\$ 30 billion towards development of sectoral infrastructure, according to the Investment Commission of India (IBEF, 2010).

In addition to the above sectors, South Korean firm may also explore investment opportunities in financial services, power, telecommunications, banking, insurance, real estate sectors, food processing Industry and electronics.

8. CONCLUDING REMARKS

The present study reveals that India and South Korea will have positive effect on consumer's surplus as a result of this CEPA. To this point, it is assumed that producers and exporters will pass the benefits of tariff reductions on to consumers. If the benefits of tariff dismantlement are not passed on to consumers but are captured by the exporter or the importer, it is possible that there will be no increase in consumer welfare. It is therefore crucial to ensure that consumer welfare is transmitted to consumers. To this end, it is necessary that the competition policy shield consumers against possible abuse of potential dominant positions or against collusion from large importers. Competition policy capacities and the judicial system supporting it should therefore be strengthened to ensure that the CEPA delivers its potential benefits. The present study also indicates that India and South Korea will gain in terms of trade by US\$ 5.7 billion and US\$ 1.82 billion respectively.

Despite positive trade and consumer surplus gains, the overall assessment of the FTA part of IKCEPA may cause welfare loss for India as indicated by CGE Analysis. Welfare loss can also be explained by the fact that India is likely face a large negative trade diversion effect out of this FTA which will offset the positive trade creation effect. However, CGE analysis reveals positive welfare gains for South Korea. The sensitivity analysis indicates

that the results are more stable for South Korea compared to India in case of free trade in Goods. Like other FTAs/CEPA, this CEPA is also expected to cause revenue loss for both partners. In order to tamper the losses in budget revenues, India should seek to diversify their tax base and develop alternative less distortionary revenue generating strategy. It is more critical issue for India given her development requirements.

In the light of this study, it may be concluded that India-Korea CEPA may not be delivering static gains in terms of trade. However, dynamic gains for India may be huge in terms of Korean FDI inflows, trade in services and technology transfer. The successful implementation of CEPA and proactive policy coordination will encourage collaboration between small and medium size Korean companies to synergize with Indian small and medium enterprises in the various areas of economy. Both side need to focus on removal of non-tariff barriers in goods trade, investment, services and technology transfers, otherwise predicted gains may not be materialized despite tariff removal.

At the end, there is need to implement CEPA at faster rate. For instance, the reduction in tariffs on 85% of Korean exports over the next eight to 10 years is slower and less comprehensive than the Korea-U.S. and the Korea-EU free trade agreements, which will reduce or eliminate tariffs on 93% to 99% of Korean products over the next five years. CEPA has also been criticized for not addressing the financial sector.

APPENDIX

A1. Tariff Reduction or Elimination under CEPA

1. Except as otherwise provided in a Party's Schedule to this Annex, the following staging categories apply to the reduction or elimination of customs duties by each Party pursuant to Article 2.4.1:

- i) duties on originating goods provided for in the items in staging category E-0 in a Party's Schedule shall be eliminated entirely and such goods shall be duty-free on the date this Agreement enters into force;
- ii) duties on originating goods provided for in the items in staging category E-5 in a Party's Schedule shall be removed in five equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty free, effective January 1 of year four;
- iii) duties on originating goods provided for in the items in staging category E-8 in a Party's Schedule shall be removed in eight equal annual stages beginning on the date this Agreement enters into force, and such goods shall be duty free, effective January 1 of year seven;
- iv) duties on originating goods provided for in the items in staging category RED in a Party's Schedule shall be reduced to one to five percent from the base rate in eight equal annual stages beginning on the date this Agreement enters into force, and such goods shall remain at one to five percent, effective January 1 of year seven;
- v) duties on originating goods provided for in the items in staging category SEN in a Party's Schedule shall be reduced:
 - for India, by fifty percent of the base rate in ten equal annual stages beginning on the date this Agreement enters into force, and such goods shall remain at fifty percent of the base rate, effective January 1 of year nine; and
 - for Korea, by fifty percent of the base rate in eight equal annual stages beginning on the date this Agreement enters into force, and such goods shall remain at fifty percent of the base rate, effective January 1 of year seven;
- vi) duties on originating goods provided for in the items in staging category EXC. in a Party's Schedule are exempt from the obligation of tariff reduction or elimination.

2. Tariff reduction or elimination pursuant to paragraph 1 shall be carried out in accordance with the following timetable:

Percentages of Annual Tariff Reduction for Korea

Category	Entry into Force	Jan. 1 Year 1	Jan. 1 Year 2	Jan. 1 Year 3	Jan. 1 Year 4	Jan. 1 Year 5	Jan. 1 Year 6	Jan. 1 Year 7
E-0	100%							
E-5	20%	40%	60%	80%	100%			
E-8	12.5%	25%	37.5%	50%	62.5%	75%	87.5%	100%
RED	12.5% of [Base Rate (in %s) minus 1-5%]	25% of [Base Rate (in %s) minus 1-5%]	37.5% of [Base Rate (in %s) minus 1-5%]	50% of [Base Rate (in %s) minus 1-5%]	62.5% of [Base Rate (in %s) minus 1-5%]	75% of [Base Rate (in %s) minus 1-5%]	87.5% of [Base Rate (in %s) minus 1-5%]	100% of [Base Rate (in %s) minus 1-5%]
SEN.	6.3%	12.5%	18.8%	25%	31.3%	37.5%	43.8%	50%

Percentages of Annual Tariff Reduction for India

Cate-gory	Entry into Force	Jan. 1 Year 1	Jan. 1 Year 2	Jan. 1 Year 3	Jan. 1 Year 4	Jan. 1 Year 5	Jan. 1 Year 6	Jan. 1 Year 7	Jan. 1 Year 8	Jan. 1 Year 9
E-0	100%									
E-5	20%	40%	60%	80%	100%					
E-8	12.5%	25%	37.5%	50%	62.5%	75%	87.5%	100%		
RED	12.5% of [Base Rate (in %s) minus 1-5%]	25% of [Base Rate (in %s) minus 1-5%]	37.5% of [Base Rate (in %s) minus 1-5%]	50% of [Base Rate (in %s) minus 1-5%]	62.5% of [Base Rate (in %s) minus 1-5%]	75% of [Base Rate (in %s) minus 1-5%]	87.5% of [Base Rate (in %s) minus 1-5%]	100% of [Base Rate (in %s) minus 1-5%]		
SEN.	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%

3. The base rate of customs duty for determining the interim rate of customs duty for an item shall be the MFN customs duty rate applied on 1 April 2006.
4. For the purposes of this Annex and a Party's Schedule, year one means the subsequent year after this Agreement enters into force as provided in Article 15.7 (Entry into Force).
5. For the purposes of this Annex and a Party's Schedule, beginning in year one, each annual stage of tariff reduction shall take effect on January 1 of the relevant year.

Table A1 Trade Indicators Statistics
(Reporter-India, Partner-Korea, Rep.)

Year	Export Growth (%)	Export Intensity Index	Export Share (%)	Import Growth (%)	Import Share (%)	Total Trade Growth (%)	Total Trade, in Million US\$	Trade Intensity Index	Trade Share (%)
1991	47.5	0.66	1.3	-3.6	1.6	13.5	555.0	0.76	1.5
1992	-18.6	0.57	1.0	30.6	1.8	9.2	606.0	0.78	1.4
1993	17.3	0.56	1.1	-10.8	1.7	-1.7	595.8	0.70	1.4
1994	20.9	0.54	1.2	90.0	2.7	63.3	972.7	0.92	2.0
1995	41.5	0.55	1.3	3.3	2.1	14.2	1,111.2	0.74	1.7
1996	27.8	0.63	1.6	16.6	2.3	20.6	1,339.9	0.84	2.0
1997	-4.7	0.62	1.4	16.3	2.4	8.4	1,452.6	0.85	1.9
1998	-27.6	0.70	1.0	33.3	3.1	13.2	1,644.1	1.15	2.2
1999	24.9	0.63	1.2	0.6	2.7	5.7	1,738.0	0.94	2.1
2000	5.3	0.47	1.1	-24.2	2.0	-16.8	1,445.9	0.63	1.6
2001	119.8	1.04	2.2	56.6	2.6	76.6	2,553.6	1.05	2.4
2002	-40.2	0.55	1.2	-7.9	2.4	-20.6	2,028.3	0.78	1.9
2003	22.2	0.55	1.2	75.4	3.4	59.6	3,237.2	0.99	2.4
2004	24.3	0.54	1.2	24.0	3.1	24.1	4,016.2	0.90	2.3
2005	78.6	0.73	1.7	38.6	3.1	47.7	5,930.9	0.97	2.5
2006	43.7	0.83	1.9	10.4	2.7	19.5	7,088.3	0.91	2.4
2007	18.1	0.77	1.8	20.7	2.4	19.9	8,497.3	0.85	2.2
2008	116.2	1.19	3.0	72.3	3.2	86.6	15,857.7	1.18	3.1

Notes: Export growth is the percentage change in the value of exports relative to the previous year. Export intensity index is the ratio of export share of a country/region to the share of world exports going to a partner. An index of more than one indicates that trade flow between countries/regions is larger than expected given their importance in world trade. Export share is the percentage of exports going to a partner to total exports of a country/region. A higher share indicates a higher degree of integration between partner countries/regions. Import growth is the percentage change in the value of imports relative to the previous year. Import share is the percentage of imports from a partner to total imports of a country/region. A higher share indicates a higher degree of integration between partner countries/regions. Total trade growth is the percentage change in the value of total trade (exports plus imports) relative to the previous year. Total trade is the sum of the value of exports and imports. Trade intensity index is the ratio of trade share of a country/region to the share of world trade with a partner. An index of more than one indicates that trade flow between countries/regions is larger than expected given their importance in world trade. Trade share is the percentage of trade with a partner to total trade of a country/region. A higher share indicates a higher degree of integration between partner countries/regions.

Source: IMF Directions of Trade Statistics, Asia Regional Integration Center - Integration Indicators Database (<http://aric.adb.org/indicators.php>).

Table A2 Trade Indicators Statistics
(Reporter- Korea, Rep, Partner- India)

Year	Export Growth (%)	Export Intensity Index	Export Share (%)	Import Growth (%)	Import Share (%)	Total Trade Growth (%)	Total Trade, in Million US\$	Trade Intensity Index	Trade Share (%)
1991	7.71	1.19	0.65	71.19	0.59	32.72	954.00	1.10	0.62
1992	-5.88	1.01	0.57	-1.49	0.58	-3.65	919.20	1.03	0.57
1993	308.42	3.23	2.10	9.55	0.60	153.13	2,326.80	2.03	1.35
1994	-35.66	1.77	1.14	11.70	0.57	-25.01	1,744.80	1.29	0.86
1995	-3.00	1.23	0.86	36.55	0.59	10.25	1,923.60	1.05	0.72
1996	4.58	1.15	0.85	22.26	0.65	11.92	2,152.80	1.01	0.75
1997	-2.24	1.09	0.80	-4.06	0.65	-3.07	2,086.80	0.99	0.72
1998	45.05	1.75	1.26	-35.13	0.65	9.09	2,276.40	1.39	1.01
1999	-18.40	1.19	0.94	26.48	0.64	-6.43	2,130.00	1.06	0.81
2000	-2.63	1.09	0.77	28.22	0.61	8.49	2,310.88	0.97	0.69
2001	6.15	1.37	0.93	12.28	0.78	8.76	2,513.36	1.20	0.86
2002	-1.68	1.19	0.85	12.96	0.82	4.76	2,633.05	1.09	0.84
2003	106.12	1.89	1.47	-1.29	0.69	55.17	4,085.69	1.33	1.09
2004	27.31	1.70	1.43	50.07	0.82	34.17	5,481.96	1.26	1.14
2005	26.59	1.66	1.61	14.17	0.81	22.40	6,709.92	1.22	1.23
2006	20.33	1.31	1.70	72.38	1.18	36.72	9,173.59	1.20	1.44
2007	19.29	1.09	1.77	27.02	1.30	22.36	11,224.46	1.09	1.54
2008	36.02	1.19	2.10	42.31	1.51	38.61	15,558.30	1.17	1.80

Source: IMF Directions of Trade Statistics, Asia Regional Integration Center - Integration Indicators Database (<http://aric.adb.org/indicators.php>).

Table A3 GTAP Regional Aggregation

No	Code	Description	Comprising
1	India	India	India
2	South Korea	South Korea	Korea
3	DevelCount	Developed Countries	Australia; New Zealand; Hong Kong; Japan; Taiwan; Singapore; Canada; United States of America; Austria; Belgium; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; Netherlands; Poland; Portugal; Slovakia; Slovenia; Spain; Sweden; United Kingdom; Switzerland; Norway; Rest of EFTA; Bulgaria; Romania
4	RestofWorld	Rest of the World	Rest of Oceania; China; Rest of East Asia; Cambodia; Indonesia; Lao People's Democratic Republ; Myanmar; Malaysia; Philippines; Thailand; Viet Nam; Rest of Southeast Asia; Bangladesh; Pakistan; Sri Lanka; Rest of South Asia; Mexico; Rest of North America; Argentina; Bolivia; Brazil; Chile; Colombia; Ecuador; Paraguay; Peru; Uruguay; Venezuela; Rest of South America; Costa Rica; Guatemala; Nicaragua; Panama; Rest of Central America; Caribbean; Albania; Belarus; Croatia; Russian Federation; Ukraine; Rest of Eastern Europe; Rest of Europe; Kazakhstan; Kyrgyzstan; Rest of Former Soviet Union; Armenia; Azerbaijan; Georgia; Iran Islamic Republic of; Turkey; Rest of Western Asia; Egypt; Morocco; Tunisia; Rest of North Africa; Nigeria; Senegal; Rest of Western Africa; Central Africa; South Central Africa; Ethiopia; Madagascar; Malawi; Mauritius; Mozambique; Tanzania; Uganda; Zambia; Zimbabwe; Rest of Eastern Africa; Botswana; South Africa; Rest of South African Customs

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